PE TITLE: High Energy Laser Research Initiatives

	Exhib	it R-2, RDT	&E Budge	t Item Just	ification			DATE	February	2008
	r activity sic Research				E NUMBER AND 601108F High		er Research	Initiatives		
	Cost (\$ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBD
5097	High Energy Laser Research Initiatves	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense (DoD) high energy laser (HEL) systems. The HEL Joint Technology Office (JTO) sends these funds to multi-disciplinary research institutes (MRIs) for projects on laser and beam control technologies. In addition, funding is spent on educational grants which are designed to stimulate interest in HELs. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. These funds are also used for modeling and simulation projects for the research of physics-based models of HEL systems. This program is in Budget Activity 1, Basic Research, because it funds scientific study and experimentation. Through this program, the DoD invests in research directed toward increasing knowledge and understanding in those fields of science and engineering related to long-term national security needs.

(U) B. Program Change Summary (\$ in Millions)

		FY 2007	<u>FY 2008</u>	FY 2009
(U) Prev	ious President's Budget	12.356	12.636	13.735
(U) Curr	rent PBR/President's Budget	12.016	12.556	13.425
(U) Tota	l Adjustments	-0.340	-0.080	
(U) Con	gressional Program Reductions			
Con	gressional Rescissions		-0.080	
Con	gressional Increases			

Congressional Increases

Reprogrammings

SBIR/STTR Transfer -0.340

(U) Significant Program Changes:

Not Applicable.

C. Performance Metrics Under Development.

R-1 Line Item No. 3 Page-1 of 5

Exhibit R-2 (PE 0601108F)

Exh	ibit R-2a, F	RDT&E Pro	ject Justif	ication			DATE	February	2008
BUDGET ACTIVITY 01 Basic Research				PE NUMBER AND TITLE 0601108F High Energy Laser			February 2008 PROJECT NUMBER AND TITLE 5097 High Energy Laser Research Initiatves		
Cost (\$ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
5097 High Energy Laser Research Initiatves	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBI
Quantity of RDT&E Articles	0	0	0	1	0	0	0	, and the second	
This program funds basic research aimed at systems. The HEL Joint Technology Office technologies. In addition, funding is spent tools, scholarships, and summer intern emp physics-based models of HEL systems. This program, the DoD invests in research direct security needs.	e (JTO) sends the content on educational loyees in militate sprogram is in	hese funds to n grants which a ry laboratories Budget Activi	nulti-disciplina re designed to . These funds ty 1, Basic Res	ary research inst stimulate intere are also used for search, because	itutes (MRIs) f st in HELs. Th or modeling and it funds scienti	or projects on lese education I simulation pr fic study and e	laser and beam al grants are use rojects for the re experimentation	control ed for education esearch of . Through this	nal
(U) MAJOR THRUST: Improve the fundame electron, and gas laser technologies. (U) In FY 2007: Completed research projects Conducted fiber laser research focused on fibers. Conducted fundamental research o call for innovative research related to gas, (U) In FY 2008: Conduct fiber laser research multiple fibers. Conduct fundamental research on selected topics in gas, free electronic fibers. Conduct fiber laser research multiple fibers. Conduct fiber laser research multiple fibers. Conduct fundamental research on selected topics in gas, free electronic fibers. Conduct fundamental research on selected topics in gas, free electronic fibers.	on closed-cycle single aperture n optically-pun free electron, a focused on sing earch on optical ctron, and solid focused on sing earch on optical	e chemical, free scaling single- nped atomic an nd solid state legle aperture scally-pumped ato state laser tech gle aperture scally-pumped ato	e electron, and mode fibers, a d molecular ga aser topics, aw ling of single- mic and molec mologies. ling of single- mic and molec	I solid state laser and organization as lasers. Condi- varded nine efformode fibers and cular gas lasers.	r initiatives. a of multiple ucted a MRI rts. l combining Initiate	<u>F</u> Y	<u>7 2007</u> 7.110	FY 2008 7.498	<u>FY 2009</u> 7.993
 (U) (U) MAJOR THRUST: Improve the fundame power laser applications. Conduct researc technology. (U) in FY 2007: Improved negative thermal expressions and strain responses of the computational atmospheric propagation effects. 	h in atmospher xpansion optica these coatings.	ic characterizated coating mate Completed res	ion and beam rials to match a earch on impr	zero expansion oving theoretica	substrates and		2.493	2.559	2.882
Decises 5007			R-1 Line Ite					Fullibit D.O.	

Project 5097

Exhibit R-2a (PE 0601108F)

	Exhibit R-2a, RDT&E Project Just	ification	D <i>l</i>	TE February	2008	
	SET ACTIVITY asic Research	PE NUMBER AND TITLE 0601108F High Energy Laser Research Initiatives	PROJECT NUMBER AND TITLE 5097 High Energy Laser Research Initiatives			
(U)	B. Accomplishments/Planned Program (\$ in Millions) Conducted an MRI call for innovative research related to improved beam control technique.	hnology and techniques	FY 2007	FY 2008	FY 2009	
	awarded four efforts.	imology and teeninques,				
(U)	In FY 2008: Complete negative thermal expansion research. Initiate research on sel control technologies and techniques.	ected topics for improved beam				
(U)	In FY 2009: Conduct research on selected topics for improved beam control technol	ogies and techniques.				
(U)						
(U)	MAJOR THRUST: Evaluate high-fidelity engineering models for incorporation into		1.765	1.794	1.800	
(U)	In FY 2007: Merged developed models into a common architecture through verifica Conducted mission-level HEL engagement scenarios and wargame HEL concepts.	tion and validation techniques.				
(U)	In FY 2008: Continue to develop models and merge them into a common architecture	e through verification and				
(0)	validation techniques. Conduct mission-level HEL engagement scenarios and warga	_				
(U)	In FY 2009: Continue to develop models and merge them into a common architecture					
	validation techniques. Conduct mission-level HEL engagement scenarios and warga	me HEL concepts.				
(U)	MAJOR WIDLIGHT F. 1.1. C. 1. C. 1.1. C		0.640	0.705	0.750	
(U) (U)	MAJOR THRUST: Fund educational grants intended to simulate interest in HEL tec. In FY 2007: Provided scholarships and internships in areas directly supporting HEL		0.648	0.705	0.750	
(0)	service academies to stimulate HEL studies among military cadets. Provided suppor					
	stimulate science and math studies, with an emphasis on lasers and optics. Funded p					
	continuing education for professionals in the HEL field.					
(U)	In FY 2008: Provide scholarships and internships in areas directly supporting HEL r					
	Service Academies to stimulate HEL studies among military cadets. Provide suppor stimulate science and math studies, with an emphasis on lasers and optics. Fund pub	ž -				
	continuing education for professionals in the HEL field.	neation of journals and				
(U)	In FY 2009: Provide scholarships and internships in areas directly supporting HEL r	esearches. Provide grants to				
	Service Academies to stimulate HEL studies among military cadets. Provide suppor					
	stimulate science and math studies, with an emphasis on lasers and optics. Fund pub	lication of journals and				
(T.T.)	continuing education for professionals in the HEL field.		12.016	10.556	12.425	
(U)	Total Cost		12.016	12.556	13.425	
		tem No. 3		- ,	(DE 000//00E)	
Pro	ect 5097 Page	3 of 5		Exhibit R-2a	(PE 0601108F)	

01 Basic Research 0601108F High Energy Laser Research Initiatives 509 Initiatives (U) C. Other Program Funding Summary (\$ in Millions) FY 2007 FY 2008 FY 2009 FY 2010 FY 2011 FY 2012 FY 2012 FY 2012 FY 2012	February 2008 DECT NUMBER AND TITLE 7 High Energy Laser Research in interest
FY 2007 FY 2008 FY 2009 FY 2010 FY 2011 FY 2012 F Actual Estimate Estimate Estimate Estimate Estimate (U) PE 0602890F, High Energy Laser Research. (U) PE 0603444F, Maui Space Surveillance System.	Lotal Cost
Actual Estimate Estimate Estimate Estimate Estimate (U) PE 0602890F, High Energy Laser Research. (U) PE 0603444F, Maui Space Surveillance System.	Lotal Cost
 (U) PE 0602890F, High Energy Laser Research. (U) PE 0603444F, Maui Space Surveillance System. 	Estimate Complete Total Cost
Laser Research. (U) PE 0603444F, Maui Space Surveillance System.	
(U) PE 0603444F, Maui Space Surveillance System.	
Surveillance System.	
(C) 1 L 00030031 , 1 la vanice	
Weapons Technology.	
(U) PE 0603924F, High Energy	
Laser Advanced Technology	
Program.	
(U) PE 0602605F, Directed Energy	
Technology.	
(U) PE 0602120A, Sensors and	
Electronic Survivability.	
(U) PE 0602307A, Advanced	
Weapons Technology.	
(U) PE 0602624A, Weapons and	
Munitions Technology.	
(U) PE 0603004A, Weapons and	
Munitions Advanced	
Technology.	
(U) PE 0602114N, Power Projection	
Applied Research.	
(U) PE 0602702E, Tactical	
Technology.	
(U) PE 0603175C, Ballistic Missile	
Defense Technology.	
(U) PE 0603883C, Ballistic Missile	
Defense Boost Phase Segment.	
(U) PE 0602651M, Joint Non-Lethal	
R-1 Line Item No. 3	l
Project 5097 Page-4 of 5	Exhibit R-2a (PE 0601108F)

DATE Exhibit R-2a, RDT&E Project Justification February 2008 PROJECT NUMBER AND TITLE PE NUMBER AND TITLE BUDGET ACTIVITY 01 Basic Research 0601108F High Energy Laser 5097 High Energy Laser Research Research Initiatives Initiatves (U) <u>C. Other Program Funding Summary (\$ in Millions)</u> Weapons Applied Research. (U) PE 0603651M, Joint Non-Lethal Weapons Technology Development. (U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication. (U) D. Acquisition Strategy Not Applicable. R-1 Line Item No. 3

Exhibit R-2a (PE 0601108F)

Project 5097